

Periodic Trends Answer Key

Practice Questions:

- 1) Arrange each set of atoms in order from largest to smallest:
 - (a) K, Li, Cs **Cs, K, Li**
 - (b) Pb, Sn, Si **Pb, Sn, Si**
 - (c) F, O, N **N, O, F**
- 2) For each of the following sets of atoms and ions, arrange them in order of increasing size:
 - (a) Se^{2-} , Te^{2-} , Se **Se, Se^{2-} , Te^{2-}**
 - (b) Co^{3+} , Fe^{2+} , Fe^{3+} **Co^{3+} , Fe^{3+} , Fe^{2+}**
 - (c) Ca, Ti^{4+} , Sc^{3+} **Ti^{4+} , Sc^{2+} , Ca**
 - (d) Be^{2+} , Na^+ , Ne **Be^{2+} , Na^+ , Ne**
- 3) Consider S, Cl, and K and their most common ions.
 - (a) List the atoms in order of increasing size.
Cl, S, K
 - (b) List the ions in order of increasing size.
 K^+ , Cl^- , S^{2-}
 - (c) Explain any differences in the orders of atomic and ionic radii.
Adding electrons makes the ion larger than the atom while removing electrons makes the ion smaller.
- 4) Predict which atom of the following pairs will have the smaller first ionization energy:
 - (a) **Cl**, Ar
 - (b) Be, **Ca**
 - (c) **K**, Co
 - (d) S, **Ge**
 - (e) **Sn**, Te
- 5) Write the equations corresponding to the following:
 - (a) The first ionization of Se
 $\text{Se} + \text{energy} \rightarrow \text{Se}^+ + \text{e}^-$
 - (b) The electron affinity of Cl^-
 $\text{Cl} + \text{e}^- \rightarrow \text{Cl}^-$
 - (c) The electron affinity of Fe^{2+}
 $\text{Fe}^{3+} + \text{e}^- \rightarrow \text{Fe}^{2+}$
 - (d) The ionization of Ba
 $\text{Ba} + \text{energy} \rightarrow \text{Ba}^+ + \text{e}^-$
- 6) Select the most electronegative atom in each of the following sets:
 - (a) Na, **Mg**, K, Ca
 - (b) P, **S**, As, Se

(c) Be, B, C, Si

(d) Zn, Ge, Ga, As

7) Select:

(a) The most electronegative element in 6A: O

(b) The least electronegative element in the group: Al, Si, P

(c) The most electronegative element in the group: Ga, P, Cl, Na